~~ADDENDUM TO THE~~ SAMPLING ANALYSIS PLAN
ADDENDUM

Cuyahoga River Gorge Dam Great Lakes Legacy Act Project, Cuyahoga Falls, Ohio

~~PREPARED FOR:~~	~~Mary Beth Giancarlo/U.S. Environmental Protection Agency (EPA) Contracting Officer's Technical Representative~~ ~~Mark Loomis/EPA Great Lakes National Program Office, Great Lakes Legacy Act Quality Assurance Lead~~
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~~DATE:~~	~~April 23, 2021~~
~~PROJECT NUMBER:~~	~~709137CH PP.06~~
~~REVISION NO.:~~	~~1~~

Remedial Design, EPA GLAES Contract Task Order 68HE0518F0667/Contract No. EP-R5-11-09

Prepared for

United States
Environmental Protection
Agency

June 2021

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Sampling Analysis Plan Addendum
Cuyahoga River Gorge Dam GLLA Project
Task Order 68HE0518F0667, Contract Number EP-R5-11-09

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Contents

SECTION 1

Introduction

This addendum to the Sampling Analysis Plan (SAP) dated October 2019 (CH2M 2019) presents the scope and rationale for soil sampling and associated data collection activities to provide the information required to further characterize soils for remedial design purposes in the sediment disposal area (Chuckery Area) within the Cuyahoga River, Cuyahoga Falls, Ohio (Figure 1). Unless otherwise indicated in this addendum, the sampling procedures and analyses will follow the 2019 SAP. A crosswalk table is provided in ~~Attachment 1~~Appendix A, which details the key SAP elements and whether they are included in this addendum or the 2019 SAP. The investigation is being conducted for the EPA's Great Lakes National Program Office in accordance with statement of work revision 6 of Task Order No. 0667, Contract No. EP-R5-11-09.

1.1 Project Organization

A copy of the SAP and this addendum will be provided to the field team members, including the drilling subcontractor, and will be available onsite during sampling. The relevant SAP requirements will also be communicated to CH2M's laboratory subcontractor ALS Environmental Holland (ALS). In addition, the objectives and requirements of the SAP will be communicated to the project team members during the project kickoff call prior to sampling.

The current project team and key project personnel are presented in Table 1 and Figure 2. New team members and their roles and responsibilities are described in the following subsections.

1.1.1 CH2M Quality Assurance Manager

Theresa Himmer replaces Jewelle Keiser as CH2M's quality assurance (QA) manager with the following responsibilities:

- Direct the QA review of the various phases of the project, as necessary.
- Direct the review of QA plans and procedures.
- Provide QA technical assistance to project staff, as necessary.

1.1.2 CH2M Project Manager

Bill Andrae replaces Julie Schucker as CH2M's project manager responsible for implementing the project. He is authorized to commit the resources necessary to meet project objectives and requirements. His primary function is to achieve the technical, financial, and scheduling objectives of the project. He will report directly to the Contracting Officer's Technical Representative, Mary Beth Giancarlo, and will be the main point of contact for matters concerning the project. The project manager has the following responsibilities:

- Define project objectives and develop a detailed work plan and schedule.
- Establish project policy and procedures to address the specific needs of the project as a whole and also the particular objectives of each task.
- Acquire and apply technical and corporate resources to meet budget and schedule constraints.
- Orient field leaders and support staff to the project's special considerations.
- Monitor and direct other team members.

- Develop and meet ongoing project or task staffing requirements, including mechanisms for reviewing and evaluating each task product.
- Review the work performed on each task to ensure quality, responsiveness, and timeliness.
- Review and analyze overall task performance with regard to the planned schedule and budget.
- Review external reports (deliverables) before submission to EPA.
- Represent the project team at meetings and public hearings.
- Ensure the project plans (SAP and health and safety plan [HASP]), field operating procedures (FOPs), and other project reports are prepared as required and the appropriate project staff are engaged.
- Verify that EPA-requested changes or updates have been incorporated into the project plans and reports.

1.1.3 CH2M Assistant Project Manager

Alison Skwarski replaces Drew Walter as CH2M's assistant project manager assisting the project manager in producing a quality work product within the authorized schedule and budget. To accomplish that goal, the assistant project manager will:

- Organize, direct, and oversee personnel and resources in the absence of the project manager, and perform tasks delegated by the project manager.
- Monitor subtask progress, quality, and adherence to authorized budgets and schedules.
- Serve as the second point of communication with the EPA contract management team and the CH2M internal program management team as necessary to keep them apprised of progress.

1.1.4 CH2M Design Manager

Nick Lindholm replaces Bill Andrae as CH2M's design manager, responsible for managing the designs for the sediment removal and disposal areas. He will participate with the project team in discussions, especially with the engineer of record.

1.1.5 CH2M Field Team Leader

Carol Gross replaces Drew Walter as CH2M's field team leader responsible for field planning activities, coordination, and oversight of the field effort. The field team leader will:

- Verify that field staff training requirements have been met.
- Arrange for field equipment and supplies.
- Oversee CH2M staff during the field effort.
- Serve as the primary point of communication with subcontractor staff and the CH2M project chemist regarding field-related logistics.
- Provide daily status updates to the CH2M project manager during the field effort.
- Verify that field documentation is appropriately maintained and tracked during and after the field effort.

1.1.6 CH2M Site Safety Coordinator

Carol Gross replaces Drew Walter as CH2M's site safety coordinator, responsible for distributing the HASP to the field team and subcontractors and ensure implementation during fieldwork.

1.1.7 CH2M Field Team Members

Kristy Crivello and Raja Kaliappan, CH2M's field team members, will be responsible for completing daily tasks and ensuring work is completed in compliance with this SAP.

1.1.8 CH2M Sample Manager

Nichole Boyea replaces Jaime Engle as CH2M's sample manager, responsible for entering the field- and analytical-collected data into the Scribe database in accordance with the *Great Lakes Legacy Act Data Reporting Standards* (EPA 2010). The CH2M sample manager will enter sampling management data daily during the field event into Scribe, and the field data will be entered in Scribe at the conclusion of the sampling event.

1.1.9 CH2M Project Chemist

Nichole Boyea replaces Jaime Engle as CH2M's project chemist, responsible for tracking analytical data and overseeing the data evaluation. Her specific responsibilities include the following:

- Schedule and coordinate activities with the analytical laboratory(s).
- Oversee tracking of samples and data from the time of field collection until results are reported to GLNPO at the end of the project.
- Coordinate and oversee data verification, validation, and production of data deliverables.
- Evaluate usability of merged field and laboratory data.
- Prepare data usability report, incorporating the results of the independent validation.
- Prepare Great Lakes Sediment Database (GLSED) deliverable.

1.1.10 SPT Drilling and Geotechnical Laboratory Subcontractor – Frontz Drilling

Steve Wright, Frontz Drilling's project manager, is responsible for coordinating and scheduling subcontractor activities for geotechnical drilling services. He is responsible for implementing relevant portions of the SAP and overseeing drilling activities. The project manager is responsible for reviewing and providing drilling measurements such as logging information at each sample location to CH2M during the field effort. The project manager will also be responsible for the collection, shipping, and analysis of geotechnical samples. The sample assignment and testing will be determined by CH2M.

1.2 Data Quality Objectives and Criteria for Data Measurement

Data quality objectives (DQOs) are qualitative and quantitative statements that define the goals of the investigation. The DQOs are used to determine the most appropriate type of data and the procedures for data collection and specify acceptable decision error limits that establish the quantity and quality of data needed for decision making. The technical planning team developed project-specific DQOs in accordance with *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA 2006). The results of the seven-step DQO process for this additional data collection activity are presented in Table 2.

1.3 Project Description and Schedule

The field investigation is designed to gather information within the Chuckery Area sediment disposal footprint to support the remedial design.

1.3.1 Disposal Area Wetland Subsurface Investigation and Borrow Source Sampling

The investigation will include geotechnical sampling activities to evaluate the wetland subsurface, evaluate the need for ground improvements, and prequalify a potential borrow source for the disposal area. The disposal area investigation activities will include:

- Performing utility locate services, including coordinating with the City of Akron and Summit Metro Parks, Ohio Utilities Protection Service (OUPS) call, and third-party services. Third-party services will clear underground utilities at a 25-foot radius around each geotechnical boring ~~location (6 locations total),~~ /cone penetrometer test (CPT) sounding ~~locations~~location (6 locations total~~),~~) and test pits (7 locations total) using ground penetrating radar. During this utility-clearance process, limited woody vegetation may need to be removed to provide access. It is assumed that the 25-foot-radius area will be a sufficient size should the borings, soundings, or test pit require an offset.
- Conducting standard penetration test (SPT) borings at 6 locations using a track-mounted rotosonic drill rig.
- Conducting CPT soundings at the 6 SPT/CPT locations to provide continuous tip resistance, sleeve friction measurements, and pore pressure dissipation testing.
- Excavating test pits near the Chuckery Area to assess material use as a possible borrow source during remedial construction. Bulk soil will be collected for geotechnical and laboratory analysis.
- Collecting 17 samples per SPT boring (including 1 Shelby tube sample per boring) and 2 per test pit, logging stratigraphy and other visual observations, processing samples, and collecting photographic documentation of field activities and samples during processing. Samples for geotechnical analyses will be processed and shipped by the drilling subcontractor under proper chain-of-custody to the designated laboratory.

1.3.2 Project Schedule

The investigation activities at the Chuckery Area are anticipated to begin in ~~May~~/June 2021 following EPA approval of the SAP addendum. The field activities are anticipated to take up to 2 weeks.

A draft data summary report will be submitted 1 month after receipt and validation of all chemical laboratory data and geotechnical laboratory data is checked for completeness and usability. CH2M anticipates a maximum turnaround time of 21-days for the analytical results and 45 days for geotechnical results. Findings of the data validation and data quality assessment will be documented in the data useability report, included as an appendix to the draft data summary report. A final version of the data summary report will be submitted 10 days after receiving comments from EPA. GLSED deliverables will be submitted 1 month after validation of all laboratory data.

SECTION 2

2 Data Generation and Acquisition

2.1 Disposal Area Investigation

Descriptions of the activities and procedures associated with the disposal area investigation are described in the following subsections. The proposed sample locations are shown in Figure ~~2~~3 and proposed coordinates are presented in Table 3. A summary of sample containers, preservation, and holding times is presented in Table 4. A summary of geotechnical analyses is presented in Table 5.

2.1.1 Mobilization and Demobilization

This task will consist of traveling, preparing the site, setting up the staging area, conducting the utility locate, and mobilizing equipment to the site prior to the field activities. Mobilization also includes coordinating between CH2M's subcontractors and arranging site access. CH2M materials and sampling supplies will be mobilized at the staging area near the Indian Signal Tree parking area. Two track-mounted drill rigs will be mobilized by the drilling subcontractor~~.~~, Frontz Drilling. Upon completion of fieldwork, personnel, equipment, and supplies will be demobilized.

2.1.2 SPT Drilling

SPT borings will be advanced by ~~a subcontractor~~Frontz Drilling using a track-mounted all-terrain vehicle rotosonic drill rig at six locations. SPT split-spoon samples of 2-foot length will be collected continuously to 20 feet below ground surface (bgs) and at 5-foot depth intervals thereafter to 50 feet bgs, or as directed by the CH2M field team member. If bedrock refusal is confirmed at depths shallower than 50 feet bgs, the boring will be terminated. Samples will be collected in accordance with the *Standard Method for Penetration Test and Split-Barrel Sampling of Soils* (ASTM D1586). The split-spoon soil samples will be visually classified by the CH2M field team member, placed in new sealable 8-ounce glass jars provided by ~~the subcontractor~~Frontz Drilling, and labeled and sealed for transport to a testing laboratory. ~~The drilling subcontractor~~Frontz Drilling is responsible for transportation to the laboratory. The borings will be logged by a CH2M field team member according to FOP-05, Logging Soil Borings. Various geotechnical laboratory tests will be performed on select soil samples determined by CH2M. Samples will be selected for specific tests according to the quality of the samples collected in an effort to obtain a representative depiction of subsurface conditions. The types and quantities of these tests are listed in Table 5.

Shelby tube samples will be collected alongside SPT borings ~~using direct-push technology methods at locations and~~via blind-drilling the rotosonic drill rig with no oscillation at depths as directed by the CH2M field team member. Shelby tube samples will be collected at ~~locations and~~ depths to sample soils representative of general conditions and to target isolated soils varying from general conditions. Shelby tube will be managed in general accordance with the *Standard Practice for Thin Walled Tube Sampling of Soils* (ASTM D1587). Undisturbed soil samples will be recovered in cohesive soils by hydraulically pushing a 3-inch-diameter, thin-walled Shelby tube a distance of about 24 inches. The samples will be visually examined in the field from the bottom and the top of the tubes. Pocket penetrometer readings will be obtained on all fine-grained soil samples from the bottom of the tubes. Wax and sealed, taped rubber end caps shall be used to seal the tubes in the field soon after the visual examination.

Bulk samples will be collected from the rotosonic drill rig plastic sleeves as requested by the CH2M field team member, to be stored in 5-gallon buckets with tight-fitting lids. These bulk samples will be used to perform Proctor compaction tests.

Equipment will be cleaned with a pressure washer prior to mobilizing to the site, prior to demobilizing the site, and between geotechnical borings as directed by the CH2M field team member.

2.1.3 CPT Soundings

CPT soundings will be advanced by the subcontractor, In-Situ Soil Testing, using a track-mounted rig at six locations to 50 feet bgs. These locations will be offset from the SPT boring locations by approximately 5 to 10 feet. If bedrock refusal is confirmed at depths shallower than 50 feet bgs, the boring will be terminated. CPT soundings and pore pressure dissipation tests will be collected in accordance with the *Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils* (ASTM D5778-12). Collection of cone resistance and frictional sleeve resistance measurements will be continuous over the 50-foot sounding. Pore pressure dissipation tests will be collected at 3-meter intervals at each location. One dilatometer test, collected in accordance with the *Standard Test Method for Performing the Flat Plate Dilatometer* (ASTM D6635), will be conducted at each of the six locations at depths determined by the CH2M field team member, which are expected to be within 20 feet of the ground surface. The depth of the dilatometer test will be determined after reviewing other sampling and testing intervals to obtain a depth representative of subsurface conditions across the site.

2.1.4 Borehole Abandonment

Following ~~their drilling, the subcontractor~~drilling and CPT soundings, Frontz Drilling and In-Situ Soil Testing will abandon the boreholes from bottom to top with a cement-bentonite grout mixture or bentonite pellets.

2.1.5 Test Pit Excavation

A soil borrow source investigation will be performed near the Chuckery Area as shown in Figure ~~2~~3. The target area will be the toe and face of the slope. A total of 7 test pits will be ~~advanced~~excavated into and up the face of the slope to ~~a depth of 10 feet, and the subcontractor~~the maximum reach of the equipment. Frontz Drilling will collect 2 bulk samples per test pit for geotechnical analysis by a geotechnical laboratory (Table 5). The test pit locations are shown in Figure ~~2~~3 but may be revised because of accessibility and field conditions. CH2M will also collect soil samples for analytical testing (Table 6). Test pits will be backfilled with the removed material and regraded once excavation is complete.

2.2 Investigation-derived Waste Management

Excess soil generated during sampling and processing of the samples will be returned to the area that was sampled.

2.3 Sample Handling and Custody Requirements

Sample management procedures, including sample handling, preservation, and custody, will be performed in accordance with the 2019 SAP (CH2M 2019).

2.3.1 Sample Containers, Handling, and Preservation

The subcontracted laboratory will provide respective sample containers (8-ounce glass jars, Shelby tubes, and 5-gallon buckets as described in Table 4), coolers, and packing materials to the project site. Sample containers will have been cleaned and certified free of the analytes of concern for the project. Specifications for the bottles will be verified by checking the supplier's certified statement and analytical results for each bottle lot. No sample containers will be reused.

2.3.2 Sample Identification System

CH2M will implement a sample numbering system that will identify each sample, including quality assurance (QA)/quality control (QC) samples. The sample number will provide a unique identifier for each sample, required by EarthSoft's Environmental Quality Information System (EQuIS) site management software, which is compatible with EPA's comprehensive manual for electronic data delivery format. The unique sample numbers will be assigned sequentially.

Each sample, regardless of analytical protocol, will also be assigned a site-specific identifier, which will contain the specific location identifiers to indicate where the sample was obtained. Sediment samples will also be identified using sample interval depths. The site-specific identifier is based on the following system:

- **Study Area**—The three-letter location code correlates to the study area.
  - CDA = Chuckery Area (upland geotech)
  - BOR = Borrow Area (borrow source soils)
- **Sample Location Type**—The next two letters following the study area indicate the type of sample location as follows:
  - SO = soil sample
  - TB = trip blank sample
- **Location Number**—Soil sample locations corresponding to the SPT/CPT location using three digits. SPT/CPT locations begin at 009 for the 2021 field investigation.
  - Soil sample locations for the borrow area will be sequentially numbered beginning at 001.
- **Sample Depth**—Depth below the sediment surface from which the sample was collected will be added after the station location at the end after a forward slash (/) in a top depth, bottom depth format (0 to 0.5 foot shown as 0.0/0.5). For example, a soil sample collected from the 0- to 0.5-foot interval at location 009 would be indicated as CDA-SO-009-0.0/0.5.
- **Trip Blanks—**Trip blanks will be identified using the following identifiers:
  - Trip blanks will be placed in each cooler with a volatile organic compound (VOC) sample and will be identified with a "TB."
  - Trip blanks will be identified with three digits starting at 001 and increasing by one for each subsequent sample and ending with the sample date (BOR-TB-001-MMDDYY is the first trip blank used during the field event, BOR-TB-008-MMDDYY is the eighth trip blank used during the borrow source sampling field event).
- **QA/QC Identifier**—Field QA/QC samples will be identified using the following QA/QC identifiers:
  - Field duplicates, which are associated with the same station location as the native sample, will be identified with a "Z" appended to the end of the location code.

- Matrix spike (MS)/matrix spike duplicate (MSD) samples are not identified in the station location identifier, but rather on the tag and the chain-of-custody form.

Sample identification examples:

- CDA-SO-009-0.0/0.5 is a soil sample collected from CPT-9 from a 0- to 0.5-foot interval.
- BOR-SO-001 is a bulk soil sample collected from test pit excavation location TP-1.

2.4 Analytical Method Requirement

Once the samples have been properly collected, documented, and successfully shipped, the subcontracted laboratories will use their promulgated analytical procedures as described in the standard operating procedures (SOPs in Appendix B of the 2019 SAP) to analyze the samples. The quantification limits for the analyses to be performed during the investigation are presented in Table 6. The subcontracted laboratory will perform the geotechnical analyses for soil as presented in Table 5. ALS will perform chemical analyses listed in Tables 6 and 7. The laboratories will use their methods and procedures as specified in Table 7.

The laboratory will use analytical SOPs to ensure that the samples are analyzed accurately and precisely. The procedures reflect the requirements of the stated methods while including internal QC criteria (~~Attachment 2~~Appendix B).

SOP Number	Title
SOP-07*	Polychlorinated Biphenyls SW846 8082/ 8082A
SOP-09*	Mercury – Aqueous EPA 245.1/SW846 ~~7470Aa~~7470A
SOP-10*	Metal by ICP-MS EPA 200.8 /SW846 6020B
SOP-12*	Semi-Volatile Organic Compounds SW846 8270E SIM/ 8270D/EPA 625.1
SOP-13*	Volatile Organic Compounds SW846 8260C
SOP-18	Mercury – Solid SW-846 7471B

*SOP previously provided in 2019 SAP and included in ~~Attachment 2~~Appendix B.

The QC criteria used during the analyses will be those stated within the SOPs, which provide details of the corrective action plans for the analytical method requirements. See Tables 5 and 7 for the complete listing of the analytical and geotechnical methods to be used for sample analysis on this project.

SECTION 3

General Field Operations

3.1 Health and Safety Plan

CH2M staff and entities directly subcontracted to CH2M will abide by U.S. Occupational Safety and Health Administration regulations and the site-specific ~~health and safety plan (~~HASP~~)~~. General topics covered in the HASP include site location and scope of work, safety and health risk analysis, field team organization and responsibilities, personal protective equipment, site control measures, decontamination procedures, emergency response plan, employee training, and medical monitoring. The previously developed HASP will be updated prior to mobilization and kept onsite during field activities, and a copy will be maintained in the project files.

SECTION 4

References

CH2M HILL, Inc. (CH2M). 2019. *Sampling Analysis Plan, Cuyahoga River Gorge Dam, Cuyahoga Falls, Ohio.* October.

U.S. Environmental Protection Agency (EPA). 2006. *Guidance on Systematic Planning Using the Data Quality Objectives Process*. EPA QA/G-4. February.

U.S. Environmental Protection Agency (EPA). 2010. *Great Lakes Legacy Act Data Reporting Standards.* March.

Tables

Table 1. Project Team and Key Personnel
Cuyahoga River Gorge Dam GLLA Project, Cuyahoga Falls, Ohio

Project Role	Personnel
EPA GLNPO Contracting Officer's Technical Representative	Mary Beth Giancarlo
EPA GLNPO Great Lakes Legacy Act Quality Assurance Lead	Mark Loomis
CH2M Program Manager	Gina Bayer
CH2M Quality Assurance Manager	Theresa Himmer*
CH2M Project Manager and Sediment Remediation Lead	Bill Andrae*
CH2M Assistant Project Manager	Alison Skwarski*
CH2M Senior Technical Consultant and Engineer of Record	Marty Reif
CH2M Design Manager	Nick Lindholm*
CH2M Field Team Leader	Carol Gross*
CH2M Health and Safety Manager	Carl Woods
CH2M Site Safety Coordinator	~~Kristy Crivello~~Carol Gross*
CH2M Field Team Members	Kristy Crivello* Raja Kaliappan
CH2M Sample Manager	Nichole Boyea*
CH2M Project Chemist	Nichole Boyea*
CH2M Database Manager	Rick Dobbins
CH2M Geographic Information System and Mining Visualization System Analyst	Justin Hansen
CH2M Administration Assistant	Tracy Cooper
SPT Drilling and Geotechnical Laboratory Subcontractor—Frontz Drilling	Steve Wright*
CPT Sounding Subcontractor—In Situ Soil Testing	Roger Failmezger
Analytical Laboratory Project Manager—ALS Environmental Holland	Chad Whelton
Analytical Laboratory Quality Assurance Manager—ALS Environmental Holland	Chad Stoike

GLNPO = Great Lakes National Program Office

* personnel changes from the 2019 SAP to the 2021 SAP Addendum

Table 2. Data Quality Objectives for ~~Sediment and~~ Soil Sampling
Cuyahoga River Gorge Dam GLLA Project, Cuyahoga Falls, Ohio

State the Problem	Goal of the Study	Information Inputs	Study Boundaries	Analytic Approach	Performance or Acceptance Criteria	Plan for Obtaining Data
The Chuckery Area requires additional geotechnical characterization within existing wetland areas to complete the remedial design for the disposal area associated with sediment removal from Gorge Dam.	The objective of the field sampling and laboratory analyses within the disposal area is to obtain additional geotechnical data within the wetland area, to be filled, to evaluate the ~~wetland subsurface~~bearing capacity and slope stability and evaluate the need for ground improvements prior to placement of the stabilized dredge material~~.~~ (SDM). The purpose of the borrow soil source investigation is to assess whether the material adjacent to Peck Road ~~is a possible borrow source~~meets the geotechnical and material characteristics to be used as a chemically clean cover material for the SDM.	**Existing Data:** Historical shallow boring logs from the City of Akron, 1984 SPT borings from eight locations within the Chuckery Area (November 2019) for evaluation of slope stability and settlement CPT and dilatometer completed at three locations within the Chuckery Area (November 2019) to provide foundation design parameters for stability and settlement. **New Data:** Six locations have been selected where SPT borings will be co-located with CPT. The SPT borings will be performed with split-spoon and Shelby tube sampling. Data obtained: "N" values for strength values (SPT N values[a] and pocket penetrometer undrained shear strength values). Soil samples will be collected and visually characterized for soil type, particle size, color, moisture, and consistency, as well as odors and staining. Samples will be collected as described under the Plan for Obtaining Data and submitted for laboratory analysis for one or more of the following: • Index Testing: grain size analysis, Atterberg limits, moisture content • Strength Testing: CIU triaxial • Settlement Testing: one-dimensional consolidation • Material Reuse Testing: Proctor compaction, remolded permeability and strength Cone penetrometer testing will be performed at six locations. The data obtained will include continuous soil profile with tip resistance and sleeve friction strength values, and pore pressure dissipation measurement to evaluate compressibility. Dilatometer testing measurement to evaluate settlement will be performed at each of the six CPT locations. One dilatometer test will be conducted per CPT sounding. Test pits will be excavated at seven locations within the proposed borrow source area. Bulk soil samples will be collected for geotechnical analysis (Index Testing and Proctor Compaction) and laboratory analysis (VOCs, SVOCs, PAHs, PCBs, and metals).	The Chuckery Area ~~(approximately 35 acres)~~ is located within the Summit Metro Park, Cascade Valley Metro Park, Cuyahoga Falls, Ohio (Figure ~~2~~3). The field investigation is expected to be conducted in ~~May/~~June/July 2021 and take ~~approximately~~ up to 2 weeks to complete.	Following drilling activities, samples will be selected for specific tests based on the strata described on the boring logs, the SPT N values, the pocket penetrometer values, the percentage recovery of samples, CPT data, and geotechnical engineering judgment. ~~Sixteen~~Approximately sixteen split-spoon samples and one Shelby tube sample will be collected from each boring (102 samples total). Soil from split-spoon samplers will be transferred to 8-oz glass jars. Three 5-gal buckets of bulk soil will be collected from the rotosonic drill rig plastic sleeves in addition to the 8-oz glass jar for three samples to be used for the Proctor compaction tests. One sample for each Proctor compaction test will be chosen from every other boring. Moisture content tests will be conducted on all 102 samples. Grain size (sieve), grain size (hydrometer), and Atterberg limit tests will be performed on 6 samples per boring (5 split-spoon samples and 1 Shelby tube per boring, 36 samples total). All 3 tests will be performed on the same 36 samples. Approximately 1 in every 3 samples from each boring will be tested for these parameters to obtain this data at varying depth in each borehole. Specific gravity and dry unit weight tests will be conducted on 1 split-spoon sample from each boring, and organic content tests will be performed on 2 split-spoon samples from each boring. One-dimensional consolidation tests and CIU triaxial compression tests (3-point) will be performed on 1 Shelby tube sample in every other boring (3 consolidation and 3 compression tests total). Moisture content, grain size (sieve and hydrometer), Atterberg limit, specific gravity, dry unit weight, and standard proctor compaction tests will be performed on two bulk soil samples per test pit location. The bulk samples will also be tested for chemical laboratory analyses. The results of test pit bulk sampling will be summarized and presented in the ~~field site sampling technical memorandum~~draft data summary report.	By ASTM and by other acceptable geotechnical industry standards. Performance criteria for analytical chemistry data are established within the EPA-approved methods and laboratory SOPs. ~~Most potential decision errors typically will be associated with field sample variability and sample collection procedures. Analytical error usually is a much smaller portion of the total error associated with an environmental measurement.~~ Definitive and screening data will be subject to PARCC requirements as described in Section 2.7.2 of the 2019 SAP.	CH2M will coordinate utility locate services with the City of Akron and Summit Metro Parks, OUPS call, and third-party services. Third-party services will clear underground utilities at a 25-foot radius around each SPT/CPT location (6 locations total) and test pit (7 locations total) using ground penetrating radar. Vegetation will be cleared as necessary to access the subsurface exploration locations. CH2M will coordinate with subcontractors and mobilize at the site. Six SPT borings will be advanced in the project area to 50 feet or bedrock refusal for visual classification and geotechnical sample collection and analysis. Samples will be transported to the subcontracted geotechnical laboratory for geotechnical testing and visual classification. Six CPT soundings will be advanced to 50 feet for direct measurement of in situ properties. Seven test pits advanced in the borrow area to ~~a depth of 10 feet,~~into and from the face of the slope to the maximum reach of the equipment and 2 bulk samples per test pit will be collected for geotechnical and chemical analysis. Upon completion of fieldwork, personnel, equipment, and supplies will be demobilized. Refer to the Data Generation and Acquisition section for additional details.

[a] ASTM D1586, Standard Method for Penetration Test and Split-Barrel Sampling of Soil.
CIU = consolidated undrained
CPT = cone penetration test
PAH = polycyclic aromatic hydrocarbon
PARCC = precision, accuracy, representativeness, completeness, and comparability
PCB = polychlorinated biphenyl
oz = ounce(s)
SDM = stabilized dredge material
SPT = standard penetration test
VOC = volatile organic compound

Table 2. Data Quality Objectives for ~~Sediment and~~ Soil Sampling
Cuyahoga River Gorge Dam GLLA Project, Cuyahoga Falls, Ohio

State the Problem	Goal of the Study	Information Inputs	Study Boundaries	Analytic Approach	Performance or Acceptance Criteria	Plan for Obtaining Data
gal = gallon(s)		OUPS = Ohio Utilities Protection Service		SVOC = semivolatile organic compound ~~VOC = volatile organic compound~~		

Table 3. Sample Locations and Summary
Cuyahoga River Gorge Dam Pool Sediments Site, Cuyahoga Falls, Ohio

Location ID	Latitude[a]	Longitude[a]
Disposal Area Drilling/Sounding Locations		
SPT-9/CPT-9	-81.523309	41.114904
SPT-10/CPT-10	-81.524368	41.115027
SPT-11/CPT-11	-81.524667	41.115607
SPT-12/CPT-12	-81.523368	41.115598
SPT-13/CPT-13	-81.522942	41.116431
SPT-14/CPT-14	-81.522550	41.115217
Borrow Source Test Pit Locations		
TP-1	-81.518791	41.116591
TP-2	-81.518901	41.116575
TP-3	-81.518989	41.116535
TP-4	-81.519051	41.116486
TP-5	-81.519113	41.116429
TP-6	-81.519183	41.116371
TP-7	-81.519231	41.116294

[a] Latitude and longitude coordinates in World Geodetic System (WGS) 1984

ID = identification

Table 4. Sample Containers, Preservatives, and Holding Times
Cuyahoga River Gorge Dam GLLA Project, Cuyahoga Falls, Ohio

Analysis	Method	Matrix	Sample Container	Preservation	Holding Times[a]
Geotechnical Soil					
Grain Size (Sieve)	ASTM D422	Soil		—	—
Grain Size (Hydrometer)	ASTM D7928	Soil		—	—
Moisture Content	ASTM D2216	Soil		—	—
Atterberg Limits	ASTM D4318	Soil	Shelby tubes/8-oz glass jars	—	—
Specific Gravity	ASTM D854	Soil		—	—
Organic Content	ASTM D2974	Soil			
Dry Unit Weight Determinations—Submerged	ASTM D7263	Soil		—	—
Proctor Compaction	ASTM D698	Soil	5-gal buckets and 8-oz glass jars	—	—
1-D Consolidation	ASTM D2435	Soil		—	—
CIU Triaxial Compression (3-point)	ASTM D4767	Soil	Shelby tubes	—	—
Borrow Source (Soil)					
Volatile Organic Compounds	SW-846 8260	Soil	4 × 40-mL VOA Terracore kit	≤6˚C, MeOH	48 hours (freeze at lab), 14 days analyze
Semivolatile Organic Compounds	SW-846 8270	Soil	1 × 4-oz glass jar	≤6˚C	~~7~~14 days extract 40 days analyze
Polycyclic Aromatic Hydrocarbons	SW-846 8270 SIM	Soil	1 × 4-oz glass jar	≤6˚C	~~7~~14 days extract 40 days analyze
Polychlorinated Biphenyls	SW-846 8082	Soil	1 × 4-oz glass jar	≤6˚C	365 days extract/analyze
Metals	SW-846 ~~6010/~~6020 /~~7470~~7471	Soil	1 × 4-oz glass jar	≤6˚C	180 days (28 days for mercury) analyze

[a] Holding times are from the time of sample collection.

˚C = degree(s) Celsius

1-D = one-dimensional

MeOH = methanol

mL = milliliter(s)

VOA = volatile organic analysis

Table 5. Summary of Geotechnical Parameters and Sample Quantities
Gorge River Sediments Site, Cuyahoga Falls, Ohio

Analysis	Method	No. of ~~Samples~~Samples[a]
Disposal Area ~~*Sampling*~~[a]*Sampling*[b]		
Moisture Content	ASTM D2216	102
Grain Size (Sieve)	ASTM D422	36
Grain Size (Hydrometer)	ASTM D7928	36
Atterberg Limits	ASTM D4318	36
Specific Gravity	ASTM D854	6
Organic Content	ASTM D2974	12
Dry Unit Weight Determinations	ASTM D7263	6
Proctor Compaction	ASTM D698	3
One-Dimensional Consolidation	ASTM D2435	3
CIU Triaxial Compression (3-point)	ASTM D4767	3
Borrow Area Test Pits (2 bulk samples per test pit)		
Moisture Content	ASTM D2216	14
Grain Size (Sieve)	ASTM D422	14
Grain Size (Hydrometer)	ASTM D7928	14
Atterberg Limits	ASTM D4318	14
Specific Gravity	ASTM D854	14
Dry Unit Weight Determinations	ASTM D7263	14
Standard Proctor Compaction	ASTM D698	14

[a] The number of samples is a planned value. Based on the actual conditions encountered, the geotechnical engineer may adjust the total number of samples.

[b] Moisture Content: approximately one per split-spoon sample (16 per boring) plus one per Shelby tube sample (six Shelby tubes)

Grain Size (Sieve): six per boring

Grain Size (Hydrometer): six per boring

Atterberg Limits: six per boring

Specific Gravity: one per boring

Organic Content: two per boring

Dry Unit Weight Determinations: one per boring

Proctor Compaction, One-Dimensional Consolidation, and CIU Triaxial Compression (3-point): one every two borings

Table 6. Summary of Chemical Analyses and Estimated Sample Quantities
Cuyahoga River Gorge Dam GLLA Project, Cuyahoga Falls, Ohio

Analysis	Extraction and Analysis Methods	Field Samples	QA/QC Samples				Total No. of Samples[b]
			FD	MS/MSD[a]	EB	PES	
Borrow Source (Soils)							
Volatile Organic Compounds	SW-846 8260	14	2	1	-	1	19
Semivolatile Organic Compounds	SW-846 8270	14	2	1	-	1	19
Polycyclic Aromatic Hydrocarbons	SW-846 8270 SIM	14	2	1	-	1	19
Polychlorinated Biphenyls	SW-846 8082	14	2	1	-	1	19
Metals	SW-846 ~~6010/~~6020 /~~7470~~7471	14	2	1	-	1	19

[a] MS/MSD laboratory requires triplicate volume of sample.

[b] Sample quantities are estimated and subject to change.

EB = equipment blank

FD = field duplicate

PES = performance evaluation sample

Table 7. Method Reporting Limits—Borrow Source Soil
Cuyahoga River Gorge Dam GLLA Project, Cuyahoga Falls, Ohio

Parameter	CAS No.	Project Screening Value[a]	Unit	Achievable Laboratory Limits RL	~~MDL~~MDL[b]	RL/MDL Units
VOCs by SW-846 8260						
Acetone	67-64-1	64,000,000	µg/kg	100	89.03	µg/kg
Benzene	71-43-2	64,000	µg/kg	30	14.53	µg/kg
Bromochloromethane	74-97-5	--	--	30	15.26	µg/kg
Bromodichloromethane	75-27-4	--	--	30	16.80	µg/kg
Bromoform	75-25-2	--	--	30	12.63	µg/kg
Bromomethane	74-83-9	--	--	100	57.38	µg/kg
2-Butanone/Methyl Ethyl Ketone (MKE)	78-93-3	37,000,000	µg/kg	200	24.68	µg/kg
Carbon disulfide	75-15-0	1,400,000	µg/kg	30	15.53	µg/kg
Carbon tetrachloride	56-23-5	5,500	µg/kg	30	11.74	µg/kg
Chlorobenzene	108-90-7	410,000	µg/kg	30	9.96	µg/kg
Chloroethane	75-00-3	2,200,000	µg/kg	100	29.52	µg/kg
Chloroform	67-66-3	6,600	µg/kg	30	10.99	µg/kg
Chloromethane	74-87-3	--	--	100	82.00	µg/kg
cis-1,2-Dichloroethene	156-59-2	760,000	µg/kg	30	19.29	µg/kg
cis-1,3-Dichloropropene	10061-01-5	--	--	30	22.60	µg/kg
Cyclohexane	110-82-7	--	--	100	26.94	µg/kg
Dibromochloromethane	124-48-1	130,000	µg/kg	30	16.85	µg/kg
1,2-Dibromo-3-chloropropaneb/Dibromochloropropane (DBCP)	96-12-8	--	--	N/A	N/A	µg/kg
1,2-Dibromoethane/Ethylene Dibromide (EDB)	106-93-4	--	--	30	8.43	µg/kg
1,2-Dichlorobenzene	95-50-1	370,000	µg/kg	30	11.38	µg/kg
1,3-Dichlorobenzene	541-73-1	--	--	30	10.01	µg/kg
1,4-Dichlorobenzene	106-46-7	60,000	µg/kg	30	7.23	µg/kg
Dichlorodifluoromethane	75-71-8	380,000	µg/kg	100	36.31	µg/kg
1,1-Dichloroethane	75-34-3	2,000,000	µg/kg	30	10.94	µg/kg
1,2-Dichloroethane	107-06-2	8,700	µg/kg	100	45.00	µg/kg
1,1-Dichloroethene	75-35-4	760,000	µg/kg	30	9.72	µg/kg

Table 7. Method Reporting Limits—Borrow Source Soil

Cuyahoga River Gorge Dam GLLA Project, Cuyahoga Falls, Ohio

Parameter	CAS No.	Project Screening Value[a]	Unit	Achievable Laboratory Limits		
				RL	~~MDL~~MDL[b]	RL/MDL Units
1,2-Dichloropropane	78-87-5	19,000	µg/kg	30	22.11	µg/kg
Ethylbenzene	100-41-4	230,000	µg/kg	30	6.33	µg/kg
2-Hexanone	591-78-6	--	--	30	14.88	µg/kg
Isopropylbenzene (Cumene)	98-82-8	260,000	µg/kg	30	9.15	µg/kg
m-~~Xylene[b]~~Xylene[c]	108-38-3	370,000	µg/kg	60	40.00	µg/kg
p-~~Xylene[b]~~Xylene[c]	106-42-3	370,000	µg/kg	60	40.00	µg/kg
o-Xylene	95-47-6	370,000	µg/kg	30	11.60	µg/kg
4-Methyl-2-pentanone/Methyl Isobutyl Ketone (MIBK)	108-10-1	5,800,000	µg/kg	30	27.96	µg/kg
Methyl Acetate	79-20-9	--	--	250	35.92	µg/kg
Methyl Tert-Butyl Ether (MTBE)	1634-04-4	850,000	µg/kg	30	8.65	µg/kg
Methylcyclohexane	108-87-2	--	--	30	11.44	µg/kg
Methylene Chloride	75-09-2	250,000	µg/kg	250	79.61	µg/kg
Styrene	100-42-5	1,700,000	µg/kg	30	11.89	µg/kg
1,1,2,2-Tetrachloroethane	79-34-5	11,000	µg/kg	30	13.24	µg/kg
Tetrachloroethene	127-18-4	17,000	µg/kg	30	18.07	µg/kg
Toluene	108-88-3	520,000	µg/kg	30	8.19	µg/kg
trans-1,2-Dichloroethene	156-60-5	180,000	µg/kg	30	11.03	µg/kg
trans-1,3-Dichloropropene	10061-02-6	--	--	30	16.75	µg/kg
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	--	--	30	19.00	µg/kg
1,2,3-Trichlorobenzene	87-61-6	--	--	100	36.00	µg/kg
1,2,4-Trichlorobenzene	120-82-1	--	--	100	34.00	µg/kg
1,1,1-Trichloroethane	71-55-6	1,300,000	µg/kg	30	13.61	µg/kg
1,1,2-Trichloroethane	79-00-5	25,000	µg/kg	30	12.75	µg/kg
Trichloroethene	79-01-6	65,000	µg/kg	30	13.45	µg/kg
Trichlorofluoromethane	75-69-4	1,200,000	µg/kg	30	15.34	µg/kg
Vinyl Chloride	75-01-4	4,600	µg/kg	30	19.94	µg/kg
SVOCs by SW-846 8270						
Acenaphthene	83-32-9	3,500,000	µg/kg	7	4.82	µg/kg
Acenaphthylene	208-96-8	--	--	7	5.78	µg/kg
Acetophenone	98-86-2	6,300,000	µg/kg	33	5.22	µg/kg

Table 7. Method Reporting Limits—Borrow Source Soil

Cuyahoga River Gorge Dam GLLA Project, Cuyahoga Falls, Ohio

				Achievable Laboratory Limits		
Parameter	**CAS No.**	**Project Screening Value[a]**	**Unit**	**RL**	~~MDL~~MDL[b]	**RL/MDL Units**
Anthracene	120-12-7	18,000,000	µg/kg	7	4.70	µg/kg
Atrazine	140-57-8	--	--	33	19.53	µg/kg
Benzaldehyde	100-52-7	--	--	67	51.20	µg/kg
Benzo[a]anthracene	56-55-3	11,000	µg/kg	7	5.76	µg/kg
Benzo[a]pyrene	50-32-8	11,000	µg/kg	7	4.09	µg/kg
Benzo[b]fluoranthene	205-99-2	11,000	µg/kg	7	4.97	µg/kg
Benzo[g,h,i]perylene	191-24-2	--	--	7	5.11	µg/kg
Benzo[k]fluoranthene	207-08-9	110,000	µg/kg	7	5.05	µg/kg
1,1-Biphenyl	92-52-4	--	--	33	5.41	µg/kg
Bis(2-chloroethoxy)methane	111-91-1	--	--	33	21.11	µg/kg
Bis(2-chloroethyl)ether	111-44-4	--	--	33	9.44	µg/kg
Bis(2-ethylhexyl)phthalate (BEHP and DEHP)	117-81-7	190,000	µg/kg	33	27.57	µg/kg
4-Bromophenyl Phenylether	101-55-3	--	--	33	18.26	µg/kg
Butylbenzylphthalate	85-68-7	58,000	µg/kg	67	41.73	µg/kg
Caprolactam	105-60-2	--	--	67	51.26	µg/kg
Carbazole	86-74-8	430,000	µg/kg	33	9.82	µg/kg
4-Chloro-3-Methylphenol	59-50-7	--	--	33	9.50	µg/kg
4-Chloroaniline	106-47-8	--	--	67	16.94	µg/kg
2-Chloronaphthalene	91-58-7	--	--	7	4.66	µg/kg
2-Chlorophenol	95-57-8	--	--	33	10.50	µg/kg
4-Chlorophenyl Phenylether	7005-72-3	--	--	33	9.21	µg/kg
Chrysene	218-01-9	1,100,000	µg/kg	7	5.39	µg/kg
Di-n-butylphthalate	84-74-2	110,000	µg/kg	33	20.45	µg/kg
Di-n-octylphthalate	117-84-0	12,000	µg/kg	33	28.83	µg/kg
Dibenzo[a,h]anthracene	53-70-3	1,100	µg/kg	7	3.60	µg/kg
Dibenzofuran	132-64-9	--	--	33	4.90	µg/kg
3,3-Dichlorobenzidine	91-94-1	19,000	µg/kg	167	15.56	µg/kg
2,4-Dichlorophenol	120-83-2	--	--	33	17.94	µg/kg
Diethyl Phthalate	84-66-2	590,000	µg/kg	33	11.34	µg/kg

Table 7. Method Reporting Limits—Borrow Source Soil
Cuyahoga River Gorge Dam GLLA Project, Cuyahoga Falls, Ohio

				Achievable Laboratory Limits		
Parameter	**CAS No.**	**Project Screening Value[a]**	**Unit**	**RL**	~~MDL~~MDL[b]	**RL/MDL Units**
2,4-Dimethylphenol	105-67-9	1,300,000	µg/kg	33	17.14	µg/kg
Dimethylphthalate	131-11-3	--	--	33	6.50	µg/kg
4,6-Dinitro-2-methylphenol	534-52-1	--	--	33	27.84	µg/kg
2,4-Dinitrophenol	51-28-5	--	--	333	243.70	µg/kg
2,4-Dinitrotoluene	121-14-2	13,000	µg/kg	33	21.65	µg/kg
2,6-Dinitrotoluene	606-20-2	13,000	µg/kg	33	21.81	µg/kg
Fluoranthene	206-44-0	2,400,000	µg/kg	7	3.20	µg/kg
Fluorene	86-73-7	2,400,000	µg/kg	7	4.84	µg/kg
Hexachlorobenzene	118-74-1	5,200	µg/kg	33	9.70	µg/kg
Hexachlorobutadiene/Hexachloro-1,3-Butadiene	87-68-3	13,000	µg/kg	33	7.85	µg/kg
Hexachlorocyclopentadiene	77-47-4	--	--	33	31.60	µg/kg
Hexachloroethane	67-72-1	63,000	µg/kg	33	13.80	µg/kg
Indeno[1,2,3-c,d]pyrene	193-39-5	11,000	µg/kg	7	4.64	µg/kg
Isophorone	78-59-1	4,600,000	µg/kg	167	6.51	µg/kg
2-Methylnaphthalene	91-57-6	--	--	7	3.39	µg/kg
2-Methylphenol (o-cresol)	95-48-7	3,100,000	µg/kg	33	9.01	µg/kg
4-Methylphenol (p-cresol)[~~c~~d]	106-44-5	310,000	µg/kg	33	18.17	µg/kg
N-Nitroso-di-n-propylamine	621-64-7	--	--	33	5.50	µg/kg
N-Nitrosodiphenylamine	86-30-6	1,300,000	µg/kg	33	19.03	µg/kg
Naphthalene	91-20-3	69,000	µg/kg	7	4.26	µg/kg
2-Nitroaniline	88-74-4	--	--	33	18.51	µg/kg
3-Nitroaniline	99-09-2	--	--	33	19.34	µg/kg
4-Nitroaniline	100-01-6	--	--	167	51.70	µg/kg
Nitrobenzene	98-95-3	27,000	µg/kg	167	11.20	µg/kg
2-Nitrophenol	88-75-5	--	--	33	9.50	µg/kg
4-Nitrophenol	100-02-7	--	--	167	78.07	µg/kg
2,2-Oxybis-1-chloropropanea	39638-32-9	--	--	33	7.81	µg/kg
Pentachlorophenol	87-86-5	55,000	µg/kg	33	26.48	µg/kg
Phenanthrene	85-01-8	--	--	7	3.10	µg/kg

Table 7. Method Reporting Limits—Borrow Source Soil
Cuyahoga River Gorge Dam GLLA Project, Cuyahoga Falls, Ohio

				Achievable Laboratory Limits		
Parameter	**CAS No.**	**Project Screening Value[a]**	**Unit**	**RL**	**~~MDL~~MDL[b]**	**RL/MDL Units**
Phenol	108-95-2	15,000,000	µg/kg	33	16.74	µg/kg
Pyrene	129-00-0	1,800,000	µg/kg	7	6.33	µg/kg
1,2,4,5-Tetrachlorobenzene	95-94-3	--	--	167	7.69	µg/kg
2,3,4,6-Tetrachlorophenol	58-90-2	--	--	67	24.41	µg/kg
2,4,5-Trichlorophenol	95-95-4	6,300,000	µg/kg	33	19.75	µg/kg
2,4,6-Trichlorophenol	88-06-2	770,000	µg/kg	33	8.87	µg/kg
PAHs by SW-846 8270						
Acenaphthene	83-32-9	3,500,000	µg/kg	4.17	3.546	µg/kg
Acenaphthylene	208-96-8	--	--	4.17	3.329	µg/kg
Anthracene	120-12-7	18,000,000	µg/kg	4.17	3.762	µg/kg
Benzo[a]anthracene	56-55-3	11,000	µg/kg	4.17	4.040	µg/kg
Benzo[a]pyrene	50-32-8	11,000	µg/kg	4.17	3.344	µg/kg
Benzo[b]fluoranthene	205-99-2	11,000	µg/kg	4.17	3.541	µg/kg
Benzo[g,h,i]perylene	191-24-2	--	--	4.17	2.403	µg/kg
Benzo[k]fluoranthene	207-08-9	110,000	µg/kg	4.17	3.411	µg/kg
Chrysene	218-01-9	1,100,000	µg/kg	4.17	3.835	µg/kg
Dibenzo[a,h]anthracene	53-70-3	1,100	µg/kg	4.17	3.388	µg/kg
Fluoranthene	206-44-0	2,400,000	µg/kg	4.17	3.307	µg/kg
Fluorene	86-73-7	2,400,000	µg/kg	4.17	3.262	µg/kg
Indeno[1,2,3-c,d]pyrene	193-39-5	11,000	µg/kg	4.17	3.643	µg/kg
Naphthalene	91-20-3	69,000	µg/kg	4.17	4.039	µg/kg
Phenanthrene	85-01-8	--	--	4.17	2.565	µg/kg
Pyrene	129-00-0	15,000,000	µg/kg	4.17	4.006	µg/kg
Total PAHs	--	--	--	4.17	2.403	µg/kg
PCB Aroclors by SW-846 8082						
Aroclor 1016	12674-11-2	--	--	66.70	22.860	µg/kg
Aroclor 1221	11104-28-2	--	--	66.70	22.860	µg/kg

Table 7. Method Reporting Limits—Borrow Source Soil

Cuyahoga River Gorge Dam GLLA Project, Cuyahoga Falls, Ohio

				Achievable Laboratory Limits		
Parameter	**CAS No.**	**Project Screening Value[a]**	**Unit**	**RL**	~~MDL~~MDL[b]	**RL/MDL Units**
Aroclor 1232	11141-16-5	--	--	66.70	22.860	µg/kg
Aroclor 1242	53469-21-9	--	--	66.70	22.860	µg/kg
Aroclor 1248	12672-29-6	--	--	66.70	22.860	µg/kg
Aroclor 1254	11097-69-1	--	--	66.70	18.620	µg/kg
Aroclor 1260	11096-82-5	--	--	66.70	18.620	µg/kg
Aroclor 1262	37324-23-5	--	--	66.70	18.620	µg/kg
Aroclor 1268	11100-14-4	--	--	66.70	18.620	µg/kg
Total PCBs	--	--	--	66.70	18.620	µg/kg
RCRA Metals by SW-846 6020/7471						
Arsenic	7440-38-2	6.7	mg/kg	0.25	0.03	mg/kg
Barium	7440-39-3	15,000	mg/kg	0.25	0.23	mg/kg
Cadmium	7440-43-9	72	mg/kg	0.1	0.015	mg/kg
Chromium	7440-47-3	--	mg/kg	0.25	0.11	mg/kg
Lead	7439-92-1	--	mg/kg	0.25	0.12	mg/kg
Selenium	7782-49-2	380	mg/kg	0.25	0.23	mg/kg
Silver	7440-22-4	380	mg/kg	0.25	0.033	mg/kg
Mercury	7439-97-6	7.6	mg/kg	0.02	0.0136	mg/kg

[a] Project screening levels are referenced from the Ohio Generic Direct-Contact Soil Standards for a Single Chemical (carcinogenic and non-carcinogenic chemicals of concern). *Ohio Administrative Code* 3745-300-08(A).

[b] Method detection limits are provided by the laboratory, ALS.

[c] m-Xylene and p-xylene will be reported as m,p-xylene.

[d] 4-Methylphenol (p-cresol) will be reported as 3&4-methylphenol.

µg/kg = microgram(s) per kilogram

MDL = method detection limit

Table 7. Method Reporting Limits—Borrow Source Soil
Cuyahoga River Gorge Dam GLLA Project, Cuyahoga Falls, Ohio

				Achievable Laboratory Limits		
Parameter	**CAS No.**	**Project Screening Value[a]**	**Unit**	**RL**	**MDLMDL[b]**	**RL/MDL Units**

mg/kg = milligram(s) per kilogram

PAH = polycyclic aromatic hydrocarbon

PCB = polychlorinated biphenyl

RCRA = Resource Conservation and Recovery Act

RL = reporting limit

SVOC = semivolatile organic compound

Figures

~~Attachment 1 –~~Appendix A
Crosswalk Table

~~Attachment 2~~

Appendix B

Analytical Laboratory Standard Operating Procedures